EXHIBIT 6

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UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA, WESTERN DIVISION

BLUE SPIKE LLC; BLUE SPIKE INTERNATIONAL LTD; WISTARIA TRADING LTD,

Plaintiffs,

v.

UNIVERSAL MUSIC GROUP, INC.; UMG MANUFACTURING & LOGISTICS, INC.; and UNIVERSAL MUSIC PUBLISHING INC. d/b/a UNIVERSAL MUSICAL PUBLISHING GROUP,

Defendants.

Case No. 2:22-cv-06331-GW (JEM)

DECLARATION OF JOSHUA DANIEL REISS

Judge: Hon. George H. Wu
Magistrate Judge: John E. McDermott

Complaint Filed:	September 6, 2022
FAC Filed:	December 13, 2022
Trial Date:	Not Set

I. INTRODUCTION

A. Description of Task

1. I have been retained by Defendants Universal Music Group, Inc., UMG Manufacturing & Logistics, Inc., and Universal Music Publishing, Inc. d/b/a Universal Music Publishing Group (collectively, "UMG") to evaluate U.S. Patent Nos. 7,664,263 ("the '263 Patent"), 7,813,506 ("the '506 Patent"), and 8,265,276 ("the '276 Patent"). Specifically, I have been asked to provide my opinion on how a person of ordinary skill in the art would understand certain terms in the '263, '506, and '276 Patents.

2. In forming my opinions, I have considered and relied on the following materials and information:

- The '263 Patent and its patent prosecution history;
- The '506 Patent and its patent prosecution history;
- The '276 Patent and its patent prosecution history;
- U.S. Patent No. 5,613,004 ("the '004 Patent"), a patent incorporated by reference into the specifications of each of the '263, '506, and '276 Patents; *See* '263 Patent at 3:66-4:4, '506 Patent at 2:4-6, and '276 Patent at 4:6-11.

B. Experience and Qualifications

3. I earned a Ph.D. in Physics from the Georgia Institute of Technology ("Georgia Tech") in December 2001. My thesis was titled, "The Analysis of Chaotic Time Series." Prior to earning my Ph.D., I earned Bachelors of Science in Mathematics and Physics in July 1995 from Georgia Tech, graduating with honors for both degrees.

4. Since 2017, I have been a Professor of Audio Engineering at Queen Mary University of London ("QMUL") in the Department of Electronic Engineering and Computer Science. Additionally, I have been the Entrepreneur-in-Residence for Science & Engineering at QMUL since 2022. Prior to my current roles, I was a Reader (2014-2017), a Senior Lecturer (2008-2014), and a Lecturer (2003-2008) at

QMUL. I was also a Visiting Researcher in the Lab. d'Automatique et de Microélectronique, at the University of Reims, France (2003), a Research Associate in the Digital Signal Processing Laboratory at QMUL (2001-2004), a Research Assistant in the Digital Signal Processing Lab at King's College London (2001), and a Teaching and Research Assistance at the Scientific Visualization Laboratory at Georgia Tech (1993-1998).

5. I have co-founded four university spin-off companies in the audio digital signal processing space since 2012: RoEx Audio in 2022, Nemisindo in 2020, Waveshaper, AI in 2019, and LandR in 2012. I am a listed inventor on over a dozen patents and patent applications. I have licensed technology to or consulted with companies in the audio digital signal processing industry, such as Yamaha, Ableton, and Antelope Audio.

6. I have been a member of the following professional organizations: the Board of Directors for Queen Mary Innovations (since 2022), the Board of the Aural Diversity Network (2021-2023), the Publications Policy Committee (chair) of the Audio Engineering Society ("AES") (since 2016), Haman Technical Council (2014-2015), Board of Governors of the AES (2013-2015), TandemLaunch Technical Advisory Board (since 2013), the ARP (2010-2012), the Institute for Electrical and Electronics Engineers (2007-2009), the Technical Committee on High Resolution Audio (co-chair) for the AES (2005-2020), and the Steering Committee for Galileo Advanced Concepts (2005-2007).

7. Since 1997, I have published over 200 peer reviewed publications, including over 40 journal papers, 10 patents, and 3 books.

8. My curriculum vitae and a listing of my publications are attached as Ex. A to this declaration.

C. Legal Standard

9. I am not an attorney. Information regarding legal concepts such as the legal standard for construing patent claims have been explained to me by counsel for

UMG. I have been informed that claim terms are generally given the ordinary meaning that they would have to a person of ordinary skill in the art ("POSITA") at the time the alleged invention was made. One should look to sources available at the time of the alleged invention that show what a POSITA would have understood the disputed claim language to mean. It is my understanding that this may include what is called "intrinsic" evidence as well as "extrinsic" evidence.

10. I understand that, in construing a claim term, one should primarily rely on intrinsic patent evidence, which includes the words of the claims themselves, the remainder of the patent specification, and the prosecution history. I understand that extrinsic evidence, which is evidence external to the patent and the prosecution history, may also be useful in interpreting patent claims when the intrinsic evidence itself is insufficient. I understand that extrinsic evidence may include principles, concepts, terms, and other resources available to a POSITA at the time of the invention.

11. I understand that words or terms should be given their ordinary and accepted meaning unless it appears that the inventors were using them to mean something else or something more specific. I understand that to determine whether a term has special meaning, the claims, the patent specification, and the prosecution history are particularly important, and may show that the inventor gave a term a particular definition or intentionally disclaimed, disavowed, or surrendered claim scope.

12. I understand that the claims of a patent define the scope of the rights conferred by the patent. I understand that, because the claims point out and distinctly claim the subject matter which the inventors regard as their invention, claim construction analysis must begin with and is focused on the claim language itself. I understand that the context of the term within the claim as well as other claims of the patent can inform the meaning of a claim term. For example, because claim terms are normally used consistently throughout the patent, how a term is used in one claim can

often inform the meaning of the same term in other claims. Differences among claims or claim terms can also be a useful guide in understanding the meaning of particular claim terms.

13. I understand that a claim term should be construed not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the entire specification. I understand that because the specification is a primary basis for construing the claims, a correct construction must align with the specification.

14. I understand that the prosecution history of the patent as well as art incorporated by reference or otherwise cited during the prosecution history are also highly relevant in construing claim terms. For instance, art cited by or incorporated by reference may indicate how the inventor and others of skill in the art at the time of the invention understood certain terms and concepts. Additionally, the prosecution history may show that the inventors disclaimed or disavowed claim scope, or further explained the meaning of a claim term.

15. With regard to extrinsic evidence, I understand that all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises, can also be considered. For example, technical dictionaries may indicate how a POSITA used or understood the claim terms. However, I understand that extrinsic evidence is considered to be less reliable than intrinsic evidence, and for that reason is generally given less weight than intrinsic evidence.

16. I understand that a claim is indefinite if a POSITA would not have understood what is claimed even after the claim is read in light of the specification. Specifically, a claim is indefinite if a POSITA would not understand the scope of the claim with reasonable certainty. I understand that a claim is indefinite if its full scope is not reasonably certain to a POSITA, even if a POSITA would be able to discern particular embodiments that are within the scope of the claim.

D. Level of a Person of Ordinary Skill in the Art

17. In determining the characteristics of a hypothetical person of ordinary skill in the art ("POSITA") of the '263, '506, and '276 Patents at the time of the claimed inventions, I considered several things, including various prior art techniques relating to audio digital signal processing and related technologies, the types of problems that such techniques gave rise to, and the rapidity with which innovations were made. I also considered the sophistication of the technologies involved, and the educational background and experience of those actively working in the field at the time. I also considered the level of education that would have been necessary to understand the '263, '506, and '276 patents. Finally, I placed myself back in the relevant period of time and considered the engineers that I have worked with and supervised in the field of audio digital signal processing and related technologies.

18. I came to the conclusion that a person of ordinary skill in the field of art of the '263, '506, and '276 patents would have had at least a bachelor's degree, or the equivalent degree, in computer science, electrical engineering, physics or a related field, and 2-3 years of experience in the research, design, or development of audio digital signal processing related hardware, software, and firmware, or equivalent experience. A person with less education but more relevant practical experience, or more education and less experience, may also meet this standard.

19. In the 1997-2000 timeframe, and in view of the types of problems encountered in the art and prior art solutions to those problems, a POSITA would have known and had the skills necessary to design, implement, and/or utilize each of the constituent parts of audio digital signal processors, including encoders and decoders, as well as the various related communications devices, including transmitters and receivers. This would include, but is not limited to, how these components and devices operate (alone and together) and the various techniques and prior art systems known at the time.

20. I am at least a POSITA and, furthermore, I have supervised those who

were also POSITAs. Moreover, I qualified as a POSITA as of 1997-2000. Accordingly, I believe that I am qualified to opine from the perspective of a POSITA regarding the meaning of terms in the claims of the '263, '506, and '276 patents.

E. Summary of Opinion

21. Upon reading claims 1, 3, 4, and 5 of the '263 Patent and claim 1 of the '276 Patent, a POSITA would not have understood the scope of the term "mask set" with reasonable certainty, and thus I understand the phrase is indefinite. "Mask set" is not a term of art to POSITAs, and the patentee did not act as his own lexicographer by defining this term in either patent's specification. Additionally, the '263 and '276 Patent specifications do not provide reasonable certainty as to as to the meaning of this term. Accordingly, in my opinion, a POSITA would not have understood the scope of the term "mask set" with reasonable certainty. To the extent the phrase "mask set" is found not to be indefinite, a POSITA could understand "mask sets" to "comprise random or pseudo-random series of bits that identify regions of the digital signal."

22. In addition, upon reading claims 6 and 7 of the '506 Patent, a POSITA would not have understood the entire scope of the claim limitation "perceptibly degraded digital content" with reasonable certainty, and thus, I understand the claim term is indefinite. While there is certainly audio content that will be perceptibly degraded to nearly all humans, and there will also be audio content that is not perceptibly degraded to nearly all humans, where to draw the line when audio content crosses over from being imperceptibly degraded to perceptibly degraded would not be known to a POSITA with reasonable certainty. That being said, to the extent the term is found not to be indefinite, a POSITA could understand that the term "perceptibly degraded digital content" means "digital content that has reduced quality compared to the non-degraded digital content as judged by an ordinary human listener."

II. BACKGROUND

A. DIGITAL SIGNAL PROTECTION

23. It has long been known that digital signals may be protected via digital signal processing methods such as dithering, hash functions, digital watermarking, key-pair encryption, and digital signatures.

24. Dithering refers to the intentional addition of noise to a digital signal. Values of the digital signal are selected randomly or varied by random amounts to add random noise to the digital signal. In some cases this added random noise may improve the quality of a digital signal by covering up artifacts of other digital signal processing techniques. However, the addition of noise to a digital signal will, in many cases, lower the quality of a digital signal. A digital signal may only take on so much noise before the random noise interferes with the content of the digital signal. In other words, dithering to reduce the quality of a digital signal is achieved by increasing the extent or intensity of dithering. Dithering may be employed in a decoder or encoder to protect a digital signal. For instance, upon receipt of a digital signal which fails verification, or upon request by an unverified consumer to decode a digital signal, a decoder may dither the digital signal to prevent enjoyment of the digital signal at full quality.

25. Hash functions, digital watermarking, key-pair encryption, and digital signatures are all digital signal processing methods which may assist in verification of digital information, e.g., digital signals, user credentials.

26. A digital signal may be processed with a hash function to generate message digests. When processed with the digital signal, these message digests will yield obviously different results if the digital signal has been changed from the configuration it was in when the message digest was generated. Thus, the result of processing the message digest with the digital signal can be analyzed to verify whether the copy differs from the original digital signal.

27. Digital watermarking involves embedding information into a digital

signal. The embedded information can be extracted and analyzed to determined characteristics about the digital signal, such as its progeny. Such information may include ownership, copyright or source information. The progeny of a given digital signal may then be used to validate an aspect of the digital signal, such as a proposed transaction of the digital signal or a claim of ownership to the digital signal. Digital watermarks may also be robust, i.e., watermarks that are difficult to find or that affect the signal quality if removed.

28. Key-pair encryption involves generating a public and private key for an intended recipient of a digital signal. The public key is known publicly, the private key is kept secret by the intended recipient, and cryptographic algorithms employed in the generation phase prevent data encrypted with the public key from being decrypted without the private key. Any party may send a digital signal encrypted with the intended recipient's known public key, and this encrypted digital signal may be openly transmitted without risk of decryption by entities without knowledge of the receiving entity's private key. As long as the intended recipient kept their private key secret, a decoder may rely on knowledge of a private key which decrypts the received digital signal to verify that the user requesting the digital signal is the intended recipient.

29. An originating party may embed a digital signature in a digital signal, which may then later be read by a recipient to verify that the digital signal originated with the originating party. An example of this may use public and private keys, but in a reversed sense compared to key-pair encryption described above. An originating party may generate a public key and private key. The public key is publicly known, the private key is kept secret by the originating party, and the cryptographic algorithms employed in the generation phase prevent the public key from decrypting data not encrypted with the private key. The originating party then encrypts a message with their private key to create a digital signature and embeds their digital signature within a digital signal. When a recipient receives the digital signal, they may extract

the digital signature and decode it with the originating party's public key. As long as the originating party kept their private key secret, a decoder may verify that the received digital signal came from the originating party based on the embedded digital signature being decryptable with the originating party's public key.

B. DIGITAL SIGNAL PROCESSING FOR VARIABLE ACCESS

30. It has also been long known that multiple tiers of access for a single digital signal can be created via digital signal processing. A signal is processed such that multiple quality levels of the digital signal can be achieved via different decryption processes employed at the receiver. A user with a higher tier key can decrypt the digital signal using their key to enjoy a higher quality digital signal. A user decrypting the digital signal with a lower tier key results in a lower quality signal. Creating multiple tiers of access via digital signal processing has been practiced in satellite navigation systems, such as GPS, which provide variable precision based on whether a user has access to military credentials to decrypt encrypted portions of the GPS signal. Multiple tiers of access from a single digital signal have also been practiced in television broadcasting systems, which may offer digital signals which can be decoded into higher quality HDTV signals with compatible television sets.

III. THE '263, '506, AND '276 PATENTS

A. The Alleged Invention of the '263 and '276 Patents

31. The '263 and '276 Patents share the same specification. The '263 and '276 Patents are directed to the protection of digital information, and more particularly, to "a method for combining transfer functions with predetermined key creation." '263 Patent at 1:17-20; '276 Patent at 1:22-25.

32. The '263 and '276 Patents describe alleged shortfalls in prior art watermarking techniques as a background for the alleged invention. *See* '263 Patent at 1:24-67; '276 Patent at 1:29-2:5. The '263 and '276 Patents allege that prior art watermarking techniques embed cryptographic information, but that the embedding process itself is not cryptographic. '263 Patent at 2:18-20; '276 Patent at 2:22-25.

Further, some prior art watermarking techniques are allegedly weak because, among other issues, their watermarks are plainly visible (i.e., in full view) or have well-defined envelopes, resulting in the prior art watermarks being easily over-encoded by attackers. '263 Patent at 2:24-28, 2:47-51, 3; '276 Patent at 2:28-31, 2:57-55. The background section finishes by noting that market incentives for higher quality versions of a digital signal may be created by providing lower quality versions of a digital signal to unauthorized users. '263 Patent at 4:38-42; '276 Patent at 4:43-46.

33. The '263 and '276 Patents describe the alleged invention with embodiments directed toward addressing the alleged shortfalls in the prior art. The disclosed embodiments utilize a predetermined key to manipulate a digital signal. '263 Patent at claims 1-7; '276 Patent at claims 1, 9, and 11-12. In some embodiments, the predetermined key comprises a mask set. '263 Patent at 8:22-26; '276 Patent at 8:24-28. Mask sets are described as being transfer function- or mapping function-based. '263 Patent at 5:26-40; '276 Patent at 5:29-43. Transfer function-based mask sets are associated with "scrambling" a digital signal via "random permutations of data formats [of the digital signal]." '263 Patent at 5:38-40; '276 Patent at 5:41-43. Mapping function-based mask sets are associated with the mapping of watermark data into a digital signal. '263 Patent at 5:35-38; '276 Patent at 5:38-41. When an embodiment employs a predetermined key utilizing transfer function- and mapping function- based mask sets, shared randomness elements between the two types of mask sets is alleged to address the security related issues of the prior art. '263 Patent at 5:29-38; '276 Patent at 5:26-35.

34. Other embodiments highlight that the transfer functions and mapping functions of the mask sets may be designed to manipulate only certain regions of a digital signal, e.g., the header region indicating the file format of the digital signal may be scrambled while the sampled region comprising the content of the digital signal is left alone, or vice versa. *See* '263 Patent at 6:12-39; '276 Patent at 6:10-37. Allegedly, where the mask sets are designed to avoid scrambling the structure of the

content, the digital signal may still be decoded by common file format based decoders to generate a degraded version of the content. '263 Patent at 6:16-18; '276 Patent at 6:18-20. The extent of the degradation may be tweaked by changing the extent of the scrambling. '263 Patent at 6:28-32; '276 Patent at 6:30-34. This capability, combined with the lossless, and therefore reversible, nature of mask sets allegedly permits the creation of multiple versions of digital signals at various signal quality levels. '263 Patent at 7:5-18; '276 Patent at 7:6-19. These various signal quality levels then, presumably, enable market incentives for higher signal quality levels, which in turn improves economic feasibility of the alleged invention. *See* '263 Patent at 7:5-11; '276 Patent at 7:6-12.

B. The Alleged Invention of the '506 Patent

35. The '506 Patent is directed to securing data content—such as an audio or video file—by scrambling part of the data content to degrade it to a lower quality level, such that it can be descrambled later to upgrade the data object to a higher quality level, generally once a user pays for the higher quality version. *See, e.g.*, '506 Patent at 2:38-52. The purported novelty of the invention is that "the streamed data is openly accessible to any potential consumer at a degraded quality (e.g., there is 'open access' to the streamed data in a scrambled or slightly scrambled state)." *Id.* at 10:43-46. A consumer can then make a decision if they want to pay to upgrade the signal. *See id.* at 11:47-51. Thus, the '506 Patent "seeks to tie layered security, while enabling open access" and can enhance the purchase experience through "teasers, try-before-you-buy, downgraded samples, combinations of content with advertising in the same channel, etc." *Id.* at 14:2-10.

C. The Patent Claims at Issue

36. I understand Plaintiffs Blue Spike LLC, Blue Spike International Ltd, and Wistaria Trading Ltd. ("Blue Spike") allege that UMG's alleged use of MQA technology infringes claims 1, 3, 4, and 5 of the '263 Patent, claim 1 of the '276 Patent, and claim 6 of the '506 Patent. The asserted claims are shown in the chart

below.

'263 Patent
1. A method for protecting a digital signal, comprising the steps of: providing a digital signal comprising digital data and file format information defining how the digital signal is encoded; creating a predetermined key to manipulate the digital signal wherein the predetermined key comprises a plurality of mask sets; and manipulating the digital signal using the predetermined key to generate at least one permutation of the digital signal parameterized by the file format information defining how the digital signal is encoded. 3. A method for protecting a digital signal, comprising the steps of: providing a digital signal comprising digital data and file format information defining how the digital signal is encoded; creating a predetermined key to manipulate the digital signal wherein the predetermined key comprises one or more mask sets having random or pseudo-random series of bits, the method further comprising the steps of: generating a hash value using the one or more masks sets; and authenticating the one or more mask sets by comparing the generated hash value with a predetermined hash value; and manipulating the digital signal using the predetermined key to generate at least one permutation of the digital signal parameterized by the file format information defining how the digital signal is encoded. 4. A method for protecting a digital signal, comprising the steps of: providing a digital signal comprising digital data and file format information defining how the digital signal is encoded; creating a predetermined key to manipulate the digital signal wherein the predetermined key comprises one or more mask sets having random or pseudo-random series of bits, the method further comprising the step of: validating the one or more mask sets before manipulating the file format information using the predetermined key: wherein said step of validating comprises the steps of: generating a digital signature using the one or more mask sets; and comparing the digital signature with a predetermined digital

signature; and manipulating the digital signal using the predetermined key to generate at least one permutation of the digital signal parameterized by the file format information defining how the digital signal is encoded.
5. A method for protecting a digital signal, comprising the steps of: providing a digital signal comprising digital data and file format information defining how the digital signal is encoded; creating a predetermined key to manipulate the digital signal wherein the predetermined key comprises one or more mask sets having random or pseudo-random series of bits, the method further comprising the step of: authenticating the one or more mask sets by comparing a generated digital signature with a predetermined digital signature; and manipulating the digital signal using the predetermined key to generate at least one permutation of the digital signal parameterized by the file format information defining how the digital signal is encoded.
'276 Patent
1. A method for protecting a digital signal, comprising the steps of: providing a digital signal comprising digital data and file format information defining how the digital signal is encoded; creating a predetermined key to manipulate the digital signal; manipulating the digital signal using the predetermined key to generate at least one permutation of the digital signal parameterized by the file format information defining how the digital signal is encoded; wherein the predetermined key comprises one or more mask sets having random or pseudo-random series of bits; and validating the one or more mask sets either before or after manipulating the file format information using the predetermined key.
'506 Patent
6. A method for distributing accessible digital content, comprising: providing a digital content comprising digital data and file format information; selecting a scrambling technique to apply to the digital content; scrambling the digital content using a predetermined key resulting in perceptibly degraded digital content wherein the scrambling technique

is based on a plurality of predetermined criteria including at least the criteria of reaching a desired signal quality level for the digital content; and

distributing the scrambled digital content.

7. The method of claim 6, further comprising the step of:

generating at least one key based on a result of the scrambling of the digital content.

D. Terms for Construction

37. I have been asked to opine on the meaning of the following terms/phrases in the '263, '506 and '276 Patents:

	Term/Phrase	Patent Claims
1.	Mask set[s]	Independent claims 1, 3, 4, and 5 of the '263 Patent and Independent claim 1 of the '276 Patent.
2.	Perceptibly degraded	Independent claim 6 (and therefore dependent claim 7 of the '506 Patent as well)

1. "mask set[s]" ('263 & '276 Patents)

38. Upon reading claims 1, 3, 4, and 5 of the '263 Patent and claim 1 of the '276 Patent, a POSITA would not have understood the scope of the phrase "mask set" with reasonable certainty, and thus I understand the phrase is indefinite. "Mask set" is not a term of art to POSITAs, and the patentee did not act as his own lexicographer by defining this term in either patent's specification. The term/phrase "mask set" is uncommonly used and does not have a well-defined meaning in the art.

39. I understand that the term "mask set" was construed in a previous case, *Blue Spike LLC et al v. Pandora Media, Inc.*, LA CV19-00748 JAK (JPRx) ("*Pandora*"), as "set[s] of bits that can be used to mask the digital signal." I disagree with the *Pandora* Court's construction at least because it is circular and because it

fails to capture any feature which would have distinguished "mask set" from any data object in the mind of a POSITA. I note that the *Pandora* Court, unfortunately, did not have the benefit of any expert testimony before it when needing to provide a claim construction.

40. The *Pandora* Court's construction would be considered circular to a POSITA because it repeats the constituent words "mask" and "set" without providing any clarity as to what a "mask set" actually is. The *Pandora* Court's construction merely states that a mask set is a set of bits used for masking. Thus, the construction fails to distinguish between different types of masking, or otherwise explain what a "mask set" is or what a "mask set" does because the words "mask" and "set" are still in the construction. While the proposed construction adds the "set of bits" aspect, I note that nearly every data object that will be processed by a computer is going to comprise a set of bits. Thus, this aspect of the construction also fails to provide any clarity as to the meaning of the term "mask set." For similar reasons, the *Pandora* Court's construction would not convey any distinguishing features of a mask set.

41. Accordingly, a POSITA attempting to discern the meaning of "mask set" from the specification would not have defined "mask set" to mean a "set of bits that can be used to mask the digital signal" as this construction still would not provide reasonable certainty regarding the scope of the claim. I understand that renders a claim term indefinite.

42. While in my opinion the claim term is indefinite, I provide the following analysis to aid the Court in construing the claim should the Court find otherwise.

43. As explained above in Section II.A, the '263 and '276 patents describe predetermined keys as comprising mask sets. '263 Patent at 8:22-26; '276 Patent at 8:24-28. Mask sets are disclosed as comprising "one or more random or pseudo-random series of bits," ('263 Patent at 5:47-49; '276 Patent at 5:50-52) but this does little to inform a POSITA what a mask set is, what it does, or how its presence in the claimed predetermined key accomplishes the functions in the claim.

44. The specification refers to transfer function-based mask sets, i.e., the mask sets used when the alleged invention "scrambles" a digital signal. '263 Patent at 5:4-9 and 5:24-42; '276 Patent at 5:7-12 and 5:27-45. "Transfer function-based mask" is also not a familiar term to a POSITA. A POSITA would understand that "transfer functions" typically are a mathematical representation of how a system's output depends on its input. It is a general term and offers no insight into what this type of mask set might be. The '263 and '276 Patents inform a POSITA that such transfer function-based mask sets manipulate the digital signal "at the inherent granularity of the file format[…]." '263 Patent at 5:62-64; '276 Patent at 5:65-6:1. This text in the intrinsic evidence, again, does little to inform a POSITA what this type of mask set is, what it does, or how its presence in the claimed predetermined key does anything. Mapping function-based mask sets are also referenced. '263 Patent at 5:24-42 and 8:22-29; '276 Patent at 5:27-45 and 8:24-31. This type of mask set is similarly vague because "mapping functions" can refer to any mathematical representation of how some data is mapped to other data.

45. The only meaningful description of masking in the intrinsic evidence comes from a prior patent from the inventor that was incorporated by reference into the specification of the '263 and '276 Patents. Specifically, the specifications reference a previous disclosure by the same inventor as an embodiment of the alleged invention wherein "the functionality of these masks is defined solely for mapping." '263 Patent at 8:28-29; '276 Patent at 8:30-32. A POSITA would understand this "previous disclosure" to be the '004 Patent, as it has the same inventor and describes the same "primary, convolution, and message delimiter masks" referenced by the '263 and '276 Patents. '263 Patent at 3:66-4:4, 8:26-28; '276 Patent at 4:6-11, 8:28-30; '004 Patent at 7:65-8:3, 9:27-49. The specification of the '004 Patent describes embedding hidden watermarks at specific regions of the digital signal, wherein the specific regions are identified by the associated primary, convolution, and message delimiter masks. '004 Patent at 4:10-15 and 7:65-9:49. The '004 Patent also

highlights that a decoder operating in a system employing the alleged invention relies on an identified region of the encoded digital signal in order to know how to decode the altered digital signal. *See* '004 Patent at 10:9-14.

46. Finally, as discussed in Section II.A, the '263 and '276 patents disclose that mask sets may be designed to manipulate only certain regions of a digital signal. *See* '263 Patent at 6:12-39; '276 Patent at 6:10-37. This is done by identifying, using the predetermined key, the region to be manipulated. '263 Patent at 6:24-27; '276 Patent at 6:25-28. Based on all of these disclosures, a POSITA would understand that whatever the "mask sets" are within the predetermined key, the mask set must have some mechanism for identifying such regions for manipulation, otherwise the alleged invention would not know which regions to selectively manipulate.

47. A POSITA looking to the '004 Patent would understand that a mask set seems to at least identify a region of a digital signal. The primary, convolution, and message delimiter masks all identify regions of a digital signal to be operated on, and the '004 Patent also indicates that a decoder in a system employing the alleged invention would rely on an indication of a region to function as a decoder. Notably, the '004 Patent is directed to keys able to "to locate the hidden message within the content" and "anyone attempting to locate the message without the keys cannot rely on pre-supposed knowledge of the message contents as a help in locating it." '004 Patent at 3:38-45. Moreover, the '004 Patent explains it "improves specifically on steganography by making use of special keys which dictate exactly where within a larger chunk of content a message is to be hidden." '004 Patent at 4:10-14.

48. Reading the less instructive embodiments disclosed directly in the '263 and '276 Patents, a POSITA would not find example mask sets inconsistent with the mask sets identifying a region of a digital signal, as described in the '004 Patent. The embodiments describing selective manipulation of digital signals involve the scrambling of specific regions of the digital signal while other regions are left alone. *See* '263 Patent at 6:10-32; '276 Patent at 6:12-34. A POSITA would understand that

a predetermined key in such an embodiment must have some mechanism for identifying such regions for manipulation, otherwise the alleged invention would not know which regions to selectively manipulate. Certainly such identification may be present in the mask sets making up the predetermined key in such embodiments.

49. This additional detail from the '004 Patent, namely, that the mask sets identify regions of a digital signal, combined with the previously mentioned disclosure that mask sets comprise "random or pseudo-random series of bits" would lead to a construction that "mask sets," as used in the context of claims 1, 3, 4, and 5 of the '263 Patent and claim 1 of the '276 Patent, "comprise random or pseudo-random series of bits that identify regions of the digital signal."

2. "perceptibly degraded digital content" ('506 Patent)

50. Claim 6 of the '506 Patent includes the claim term "perceptibly degraded digital content." In my opinion, a POSITA would not have understood the scope of the claim term with reasonable certainty, and therefore, I understand that this claim term is indefinite.

51. The first issue with the claim term is that the claim does not make clear who or what is perceiving the degraded digital content, and the patent specifications provide no guidance whatsoever as to what the inventor meant. For example, a POSITA would recognize that computers or humans can perceive audio content and have the ability to perceive whether audio has been degraded, at least to a certain extent or once content has at least been degraded by a certain amount. However, the point at which a computer will perceive degraded digital context is much different than the point at which a human can perceive the degraded digital content.

52. However, based on the purpose of the invention and the context of claims 6 and 7 (which depends from claim 6), a POSITA would likely conclude that claims 6 and 7 to be directed to a human listener. This is because the '506 Patent is generally directed to providing differential access to human users. In a typical situation, the invention described by the '506 Patent is one where scrambled, degraded content is

provided to a human consumer, and the human consumer is able to choose to upgrade to a higher quality level (e.g., through payment). A human would have no reason to upgrade the digital content if they were unable to perceive that the digital content was degraded in the first instance. Similarly, if the degraded content were only perceivable by a computer, then the distributor of the digital content would not be able to upsell its premium content and has no reason to scramble the digital content in the first instance. In addition, if a computer's perceptions were meant to be within the scope of the associated claims, a POSITA would have expected the term "measurably" rather than "perceptibly." In the mind of a POSITA, computers measure stimuli while humans perceive stimuli, even though they are arguably similar actions.

53. Even after employing this initial restriction to human perception, A POSITA still would not have reasonable certainty as to the meaning of this claim term because humans perceive audio in different ways.[1] A POSITA would understand that humans with certain training, including experts in the field or audiophiles, likely would perceive degradation of audio quality much sooner than a typical consumer or ordinary human. The '506 Patent does not teach the degree to which the audio content must be degraded in order to meet the claim, nor does the '506 Patent suggest at what degradation level humans can perceive differences in audio quality. For this reason, a POSITA, and any accused infringer, would have no way to determine with reasonable certainty when the '506 Patent is infringed.

54. By way of example, there is certainly audio content that will be perceptibly degraded to nearly all humans, and there will also be audio content that is not perceptibly degraded to nearly all humans. But where do we draw the line when

[1] I reference audio here and below because I understand this litigation relates to audio file formats. Humans can of course use other senses to perceive images, video, text, etc. My understanding of the claims, and this term, would not change if other digital media, such as video, was at issue.

audio content crosses over from being imperceptibly degraded to perceptibly degraded? Is it when a single expert or audiophile can first determine the audio has been degraded? Is it when most experts would agree the audio has been degraded? Is it when the average ordinary human perceives degradation? Or is it when almost all listeners would clearly perceive such degradation? Wherever the inventor imagined that line to be, the '506 Patent fails to convey the location of this line to a POSITA with reasonable certainty.

55. In other words, whether there is infringement of this claim limitation depends on *who* would be perceiving the digital content. If two individuals listened to the same audio stream, and one individual could hear that the audio stream had been previously degraded while the other could not, then a POSITA would not know if this claim limitation is infringed or not with reasonable certainty. Additionally, the same "level" of degradation applied to two different signals could lead to different results (either flipping the results or having both individuals find the signals to be either degraded or not degraded). For a practical example, one individual could potentially perceive degradation in one .mp3 file, but not a different .mp3 file. In this case, a POSITA would then not know whether the .mp3 file format (as a potential accused product) infringes this claim limitation.

56. Moreover, I note that the problem is even more complex if other media is considered in conjunction with audio. Humans do not perceive audio (an auditory sense) the same way as video (a visual sense), so different standards would need to be applied to determine if there was infringement of different media. For example, an audiophile may not have the same training to be able to perceive slight degradation in video content. Furthermore, an average human listener may not also be an average human observer.

57. While many studies have been done trying to identify "just noticeable differences" (i.e., the point at which one can notice a difference between two signals), the audio industry (for example), has not settled on any standard that would make this

claim term reasonably certain, e.g., that "X%," "Y level", or "Z amount" of degradation means that the degradation is certainly perceivable. Certainly the industry had not settled on any such standard as of the '506 Patent's priority date in 1996. Furthermore, if peer reviewed research publications in this area used the term "perceptibly degraded," then those publications would provide clarification on the nature of perceived differences and of how they were tested before making any claim regarding perceptible degradation. Similarly, a POSITA would expect such clarification to be provided. This information is missing from the '506 Patent.

58. To the extent the Court disagrees and finds that "perceptibly degraded digital content" is not indefinite, a POSITA would understand that the term at least needs reasonable bounds clarifying its scope for all of the reasons discussed above. To that end, if a POSITA was required to construe this term and fill in the gaps missing from the '506 Patent claims and specification, a POSITA would likely find that "perceptibly degraded digital content" means "digital content that has perceptibly reduced quality compared to the non-degraded digital content, as judged by an ordinary human listener."[2] However, I note that even this construction does not resolve substantive uncertainty in the claim when conducting an infringement analysis (i.e., how to substantively determine the level an ordinary human listener can perceive).

[2] My alternative construction includes "an ordinary human *listener*" (rather than just "an ordinary human") because I understand this case specifically relates to an audio format, and I believe it would be helpful to the Court or a jury to understand what "sense" a POSITA would understand is being evaluated in the audio context. I do not intend for this construction to expressly or implicitly narrow the scope of the '506 patent to audio digital signals only in other contexts.

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By 

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